

Single Phase Convective Heat Transfer Passive Enhancement: Techniques, Mechanisms, Performance Comparisons and Applications

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Abstract

In this keynote lecture an overview of single phase convective heat transfer passive enhancement techniques and their underlying mechanisms is provided. Then detailed analyses of the hydraulic and thermal performances of selected works conducted by the speaker's group related to thermal boundary layer redevelopment, secondary flow generation and waviness are provided to demonstrate the effectiveness of these approaches. Finally, the application of these techniques for solving various practical cooling problems ranging for direct chip liquid cooling of servers to passive displacement cooling of buildings is discussed lic performance comparisons of the enhanced structures.